

REMARKS

Claims 1-19, 25-47 and 48-50 are pending. Independent claims 1, 25 and 44 are amended with this reply, and new claims 48-50 are added. Support for the amendments can be found throughout the specification, for example, at pages 9, 11 and 16 , and at FIGS. 1-3. No new matter has been added.

Applicants thank the Examiner for withdrawing prior rejections under 35 U.S.C. §§ 102, 103 and 112, first paragraph.

**Rejections under 35 U.S.C. § 102**

Woudenberg

Claims 1, 2, 4, 5, 8-10, 12, 14, 15, 17-19, 25-30, 32, 34-36, and 39-43 have been rejected under 35 U.S.C. § 102(e) as being anticipated by, or alternatively, under § 103(a) as being obvious over, U.S. Patent No. 6,126,899 to Woudenberg et al. ("Woudenberg"). See the Office Action at pages 3-9. Claims 1 and 25 are independent.

Claim 1 relates to a device that includes a chamber body containing an optically permeable chip having a detection area with an optically permeable zone of detection, the detection area including an array of multiple different polynucleotide probes immobilized on the optically permeable chip, and an optically permeable chamber support on which the chamber body is sealingly placed to form a continuous cavity enclosing the array including an inlet by which liquid sample can be introduced to the cavity; wherein the continuous cavity forms a single reaction chamber that is adapted to amplify and characterize nucleic acids therein. See claim 1.

Claim 25 relates to a device for duplicating and characterizing nucleic acids including a chamber support, a chamber body including an optically permeable chip, the chamber body placed on the support to form a continuous cavity including an array of multiple different polynucleotide probes immobilized on the optically permeable chip, and an inlet by which liquid sample can be introduced to the cavity, wherein the continuous cavity is adapted to act as a single chamber for both reaction and characterization of nucleic acids. See claim 25.

Woudenberg does not teach a device that has a continuous cavity enclosing or including an array of immobilized multiple different polynucleotide probes. The Examiner argues that "the array of chambers taught by the reference together form a single chamber formed by between the cover (#180) and base (#161) as illustrated (Fig. 9)." See the Office Action at page 9.

Viewing the Woudenberg device as having a "single chamber" requires a strained reading of the reference. Indeed, the Examiner refers to the "array of chambers" in the plural, indicating that the device has multiple chambers. The reference describes a sample distribution network "for delivering sample to the **individual detection chambers.**" (emphasis added). Woudenberg at column 6, lines 4-5. Indeed, each detection chamber of Woudenberg is connected to the channel means by **dead-end** fluid connections (see Woudenberg at column 5, lines 1-11 and 20-27). Thus, Woudenberg describes a device having multiple different chambers, but does not describe a device having an array within a common chamber.

Nor does Woudenberg teach a device in which a continuous cavity encloses an array of multiple different polynucleotide probes immobilized on an optically permeable chip. In Woudenberg's device, each detection chamber includes a single analyte-specific reagent, but the reagents within the detection chambers are separated by dead-end fluid connections. Only when considered collectively do the detection chambers have the form of an array. **No single detection chamber encloses or includes an array of multiple different polynucleotide probes immobilized on an optically permeable chip.**

Because Woudenberg fails to describe or teach all of the claimed limitations, Applicants respectfully ask that the Examiner reconsider and withdraw these rejections.

**Rejections under 35 U.S.C. § 103(a)**

**Lipshutz in view of Sugarman**

Claims 1-5, 8-10, 12-15, 17-19, 25-36, and 38-43 have been rejected as being obvious over U.S. Patent No. 5,856,174 to Lipshutz et al. ("Lipshutz") in view of U.S. Patent No. 5,222,808 to Sugarman et al. ("Sugarman"). Claims 1 and 25 are independent.

As discussed above, the claimed device includes a continuous cavity enclosing or including an array of multiple different polynucleotide probes immobilized on an optically permeable chip where the continuous cavity forms a single reaction chamber. Lipshutz teaches a

device having multiple different chambers for performing different operations (Fig. 5A, and column 20, line 37 to column 21, line 18). Neither Lipshutz nor Sugarman teaches a device having an array of multiple different polynucleotide probes immobilized on an optically permeable chip where the continuous cavity forms a single reaction chamber that is adapted to amplify and characterize nucleic acids therein. The combination of references fails to teach all the claimed limitations.

Accordingly, Applicants respectfully ask that the Examiner reconsider and withdraw this rejection.

Northrup in view of Sugarman

Claims 44-47 have been rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,521,181 to Northrup et al. ("Northrup") in view of Sugarman. See the Office Action at pages 15-16. Claim 44 is independent, and claims 45-47 depend from it.

As discussed above, the claimed device includes a continuous cavity enclosing or including an array of multiple different polynucleotide probes immobilized on an optically permeable chip where the continuous cavity forms a single reaction chamber . Neither Northrup nor Sugarman teaches a device having an array of multiple different polynucleotide probes immobilized on an optically permeable chip where the continuous cavity forms a single reaction chamber that is adapted to amplify and characterize nucleic acids therein. The combination of references fails to teach all the claimed limitations.

Accordingly, Applicants respectfully ask that the Examiner reconsider and withdraw this rejection.

McBride

Claims 6 and 7 have been rejected under 35 U.S.C. § 103(a) as being obvious over Woudenberg or Lipshutz in view of Sugarman and in further view of U.S. Patent No. 6,296,752 to McBride et al. ("McBride"). See the Office Action at pages 16-17. Claims 6 and 7 depend from claim 1. Applicants respectfully disagree.

As discussed above, neither Woudenberg nor Lipshutz in view of Sugarman teaches all the limitations of claim 1 (from which claims 6 and 7 depend). McBride does not remedy this

defect. The combination of Woudenberg or Lipshutz in view of Sugarman with McBride does not teach, suggest or motivate a person skilled in the art to make the devices of claims 6 and 7. For at least these reasons, Applicants request that the Examiner reconsider and withdraw this rejection.

Atwood

Claim 11 has been rejected under 35 U.S.C. § 103(a) as being obvious over Lipshutz in view of Sugarman or Woudenberg in view of U.S. Patent No. 5,475,610 to Atwood et al. ("Atwood"). See the Office Action at page 17. Claim 11 depends from claim 1. Applicants respectfully disagree.

As discussed above, neither Woudenberg nor Lipshutz in view of Sugarman teaches all the limitations of claim 1 (from which claim 11 depends). Atwood does not remedy this defect. The combination of Lipshutz in view of Sugarman or Woudenberg with Atwood does not teach, suggest or motivate a person skilled in the art to make the device of claim 11. For at least these reasons, Applicants request that the Examiner reconsider and withdraw the rejection over Lipshutz or Woudenberg in view of Atwood.

Fodor

Claims 16, 17, 37 and 38 have been rejected under 35 U.S.C. § 103(a) as being obvious over Lipshutz in view of Sugarman or Woudenberg in view of U.S. Patent No. 5,744,101 to Fodor et al. ("Fodor"). See the Office Action at pages 17-18. Claims 16, 17, 37 and 38 depend from claim 1. Applicants respectfully disagree.

As discussed above, neither Woudenberg nor Lipshutz in view of Sugarman teaches all the limitations of claim 1 (from which claims 16, 17, 37 and 38 depend). Fodor does not remedy this defect. The combination of Lipshutz in view of Sugarman or Woudenberg with Fodor does not teach, suggest or motivate a person skilled in the art to make the devices of claim 16, 17, 37 or 38. For at least these reasons, Applicants request that the Examiner reconsider and withdraw the rejection over Lipshutz or Woudenberg in view of Fodor.

Applicant : Ralf Ehricht et al.  
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**New Claims**

New claims 48-50 have been added. Claim 48 is independent, and claims 49-50 depend from it. Support for the new claims can be found throughout the specification, e.g., at pages 20-25, and the figures. No new matter has been added.

The new claims require a substrate comprising a detection zone, an array of multiple different polynucleotide probes, each probe immobilized within the detection zone of the substrate, each probe being in contact with a common solution; and a heating element in thermal communication with the array and the solution. None of the cited art describes or teaches a device having an array of multiple different polynucleotide probes, each probe immobilized within the detection zone of the substrate, each probe being in contact with a common solution, and a heating element in thermal communication with the array and the solution. Applicants respectfully ask that the new claims be allowed.

**CONCLUSION**

Applicants ask that all claims be allowed. Please apply any charges or credits to deposit account 19-4293.

Respectfully submitted,

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Harold H. Fox  
Reg. No. 41,498

**Customer No. 27890**  
Steptoe & Johnson LLP  
1330 Connecticut Avenue, NW  
Washington, DC 20036-1795  
Phone: 202-429-3000  
Fax: 202-429-3902